Premium Connections
for Demanding Environments

Tenaris Hydril
TenarisHydril offers outstanding premium connection design and technology worldwide. With a comprehensive range of high performance products backed by an extensive global field service network and licensed threading shops, we develop solutions to meet the needs of any E&P operations.

TenarisHydril premium connections are provided and supported by Tenaris, a leading manufacturer and supplier of steel tubes and integrated tubular services to the world’s energy industry.

For further information please visit us at www.tenaris.com
# Application Guide

## DEEP WATER

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## CASING WHILE DRILLING

### SURFACE CASING
- Threaded & Coupled ER™

### INTERMEDIATE CASING AND LINERS
- Threaded & Coupled Blue
  - Wedge 563®
  - Wedge XP™
  - TXP® Buttress ER™
- Integral Semi Flush
  - Wedge 523® / 521®
- Integral Flush
  - Wedge 513® / 511®

### PRODUCTION CASING / LINERS AND TUBING
- Threaded & Coupled Blue
  - Wedge 563®
  - Wedge XP™ ER™
- Integral Semi Flush
  - Wedge 523® / 521®
- Integral Upset
  - Wedge 533®
- Integral Flush
  - Wedge 513® / 511®

### WORKSTRINGS

#### WORKSTRINGS AND TUBING
- Threaded & Coupled
  - Wedge 563®
- Integral Upset
  - Wedge 533®
- Integral Flush
  - Wedge 511®

### HORIZONTAL & EXTENDED REACH WELLS

#### INTERMEDIATE CASING AND LINERS
- Threaded & Coupled
  - Wedge 563®
  - Blue®
- Integral Semi Flush
  - Wedge 523® / 521®
- Integral Flush
  - Wedge 513® / 511®

#### PRODUCTION CASING / LINERS AND TUBING
- Threaded & Coupled
  - Wedge 563®
  - Wedge XP™
  - Blue®
- Integral Semi Flush
  - Wedge 625®
  - Wedge 523® / 521®
- Integral Flush
  - Wedge 513® / 511®

## GEOThERMAl

### SURFACE CASING
- Threaded & Coupled ER™

### INTERMEDIATE CASING AND LINERS
- Threaded & Coupled
  - Blue®
  - TXP® Buttress ER™
- Integral Semi Flush
  - Wedge 521®
- Integral Flush
  - Wedge 511®

### PRODUCTION CASING / LINERS AND TUBING
- Threaded & Coupled Blue® ER™
- Integral Semi Flush
  - Wedge 521®
- Integral Flush
  - Wedge 511®

### DRIVING INSTALLATION

#### CONDUCTOR AND SURFACE CASING
- Weld-on Connector BlueDock®

### CORROSION PROTECTION & ID COATING

#### TUBING
- Threaded & Coupled
  - Wedge 563® - CB (Corrosion Barrier)
  - Integral Upset
  - Wedge 533® - CB (Corrosion Barrier)

### OTHER APPLICATIONS

#### CONDUCTOR AND SURFACE CASING
- Weld-on Connector BlueDock®
- Threaded & Coupled
  - Blue® Quick Seal (*) ER™

#### INTERMEDIATE CASING AND LINERS
- Threaded & Coupled Blue® ER™

#### PRODUCTION CASING / LINERS AND TUBING
- Threaded & Coupled Blue®
  - Blue® Thermal Liner ER™
- Integral Semi Flush
  - Wedge 523® / 521®
- Integral Flush
  - Wedge 513® / 511®

(*) Comes with Dopeless® Technology.
(**) Compatible with API Buttress.

**NOTE:** Dopeless® technology alternative is available for Blue® and Wedge™ technologies, as well as for TenarisHydril ER™ and TenarisHydril MACII™.

This application guide is only a recommendation. Contact a Tenaris technical specialist before selecting connections.

In addition to this guide, most connections can perform in different environments and under load modes not listed here.
Product Characteristics

**THREADED & COUPLED**

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**Blue®**
Available in sizes from 2 3/8" to 13 5/8"

**FEATURES**
- Designed for high performance and versatility.
- ISO 13679 CAL IV tested and field proven.
- Parabolic seal contact pressure profile minimizes galling risk while improves sealing performance stability.

**APPLICATIONS**
- HP/HT & Deep Wells
- Deep Water
- Shallow Water
- Horizontal & extended reach wells
- Shales
- Casing while drilling
- Thermal (SAGD & CSS)
- Geothermal
- Surface & intermediate casing
- Production casing, tie-backs & liners
- Tubing

**OPTIONS**
- Dopeless® technology
- Matched strength
- Special bevel
- Special clearance

---

**Blue® Max**
Available in sizes from 7" to 14"

**FEATURES**
- Designed for HP/HT applications that demand 100% pipe body performance on heavier wall pipe.
- Compliant with the API RP SC5 CAL IV standard.
- 100% ratings matching the pipe body's performance in terms of tension, compression, internal and external pressures.
- Parabolic seal contact pressure profile minimizes galling risk while improves sealing performance stability.
- Easier and faster make-up provided by the twin start thread.
- Comes with Dopeless® technology.

**APPLICATIONS**
- HP/HT & Deep Wells
- Deep Water
- Intermediate casing
- Production casing
- Tie-backs
- Liners

**OPTIONS**
- Special clearance

---

**Blue® Heavy Wall**
Available in sizes from 7 5/8" to 14"

**FEATURES**
- Designed for Deep Well and HP/HT applications demanding heavy wall pipe with 100% pressure rated seals and enhanced performance.
- Successfully certified in accordance with ISO 13679 CAL IV and continues to be tested under the API RP SC5 CAL IV protocol.
- Sphere-to-cone seal geometry provides a stable sealing performance under high combined loads.
- 100% pipe body performance in terms of internal and external pressure.
- 80% tension and compression ratings (highest compression rating in the market for the segment).
- Comes with Dopeless® technology.

**APPLICATIONS**
- HP/HT & Deep Wells
- Deep Water
- Intermediate casing
- Production casing
- Tie-backs

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**Blue® Quick Seal**
Available in sizes from 18" to 22"

**FEATURES**
- Designed for large OD surface casing that requires a gas-tight seal and fast make-up, for operations potentially facing shallow gas.
- Tested in accordance with the API RP SC5 CAL I and additional elevated temperature evaluations.
- 100% pipe body structural performance.
- Comes with Dopeless® technology.

**APPLICATIONS**
- HP/HT & Deep Wells
- Deep Water
- Shallow Water
- Surface casing
**Blue® Riser**
Available in sizes from 7 5/8” to 16".

**Features**
- High fatigue resistance design: performance comparable to the pipe body.
- First engaged thread with improved fatigue performance due to the innovative R-Arch™ design.
- Double elliptical groove to improve connection fatigue resistance.
- No fretting fatigue due to external seal design.
- Gas-tight internal seal.
- Tested sealability under the API RP 5C5 CAL-IV protocol.
- Tested for fatigue performance.

**Applications**
- Deep Water
- Top-Tensioned risers
- High pressure drilling risers

**Options**
- Dopeless® technology
- Matched strength
- Special clearance
- Special bevel

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**Blue® Thermal Liner**
Available in sizes from 2 3/8” to 10 3/4”.

**Features**
- Used for slotted pipes to be utilized on heavy oil and thermal operations like SAGD and CSS.
- Fast and easy make-up with minimum cross-threading risk.

**Applications**
- Thermal (SAGD & CSS)
- Slotted liners & tubing

**Options**
- Dopeless® technology
- Matched strength
- Special clearance
- Special bevel

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**Wedge 563®**
Available in casing sizes from 5” to 13 5/8”
Available in tubing sizes from 2 3/8” to 7”.

**Features**
- 100% ratings in tension and compression provided by the dovetail threads.
- 100% collapse rate created by full form contact of the dovetail threads.
- Wedge 563® is interchangeable with Wedge 533® and Wedge 553®.

**Applications**
- HP/HT & Deep Wells
- Deep Water
- Shallow Water
- Horizontal & extended reach wells
- Shales
- Casing while drilling
- Workstrings
- Thermal (SAGD & CSS)
- Corrosion protection & ID coating
- Intermediate casing
- Production casing, tie-backs & liners
- Tubing

**Options**
- Dopeless® technology
- Matched strength
- Recess free bore (RFB)
- CB® ring

Sizes 2 3/8” to 4 1/2” have a Recess-Free Bore coupling (RFB option) as standard.
Sizes 5” to 7” must be specified as RFB option if a Recess-Free Bore coupling is required.

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**Wedge XP™**
Available in sizes from 4 1/2” to 5 1/2”.

**Features**
- Wedge thread profile providing maximum over torque capacity to manage longer laterals.
- Pin-to-Pin back up mechanism granting additional torque capability to handle rotation.
- Lower threads per inch profile (3 vs. 5 TPI of a typical BTC modified) rugged coarse thread design and deep stabbing allow for speed of installation, enhancing the performance of an industrial drilling approach.
- 100% compression
- 100% tension
- Standard bevel of 20°.

**Applications**
- Shales
- Casing while drilling
- Production casing and liners

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**ER™**
Available in sizes from 7” to 24 1/2”.

**Features**
- Easy stabbing, fast make-up with minimum cross threading risk.

**Applications**
- HP/HT & Deep Wells
- Deep Water
- Shallow Water
- Casing while drilling
- Thermal (SAGD & CSS)
- Geothermal
- Surface & intermediate casing

**Options**
- Dopeless® technology
- Matched strength
- Special clearance
- Special bevel
THREADED & COUPLED

**TXP® Buttress**
Available in sizes from 4 1/2" to 16"

**FEATURES**
- API Buttress compatible
- 100% tension
- Enhanced structural capacity:
  - 100% PBYS in compression
  - Bending same as pipe body
- Extra torque capability
- Positive torque shoulder
- Enhanced ID flow
- Make-up repeatability
- Standard Bevel of 20°

**APPLICATIONS**
- Shales
- Casing while drilling
- Geothermal
- Intermediate Casing
- Production casing, liners & tubing

**OPTIONS**
- Special clearance
- Seal ring
- Regular API

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**Wedge 623®**
Available in sizes from 7" to 16 1/2"

**FEATURES**
- Complies with the API RP 5C5 CAL-IV protocol and meets additional operator requirements for survival loads. Wedge 623® provides validated reliability under combined loads.
- Internal and external pressure seals (metal-to-metal) in line with API RP96 for deep water applications.
- Outstanding compression efficiency of 80 to 86%, equivalent to the performance of TenarisHydril Wedge 523® connection.
- Comes with Dopeless® technology.

**APPLICATIONS**
- HP/HT & Deep Wells
- Deep Water
- Shallow Water
- Intermediate casing & liners
- Production casing, liners & tie-backs.

**OPTIONS**
- Dopeless® technology

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**Wedge 625®**
Available in sizes from 4 1/2" to 7"

**FEATURES**
- 90% ratings in tension provided by the vanishing threads at the pin OD and the box ID (truly exceptional for a semi-flush integral connection).
- Over 94% ratings in compression provided by the vanishing threads at the pin OD and the box ID.
- 100% burst and collapse ratings provided by the two-way metal to metal mid seal that is locked by the adjacent dovetail Wedge threads and reinforced by the step-to-step Wedge.
- 90% ratings in bending provided by both Wedge threads and reinforced by the step-to-step Wedge design.
- Box OD approximately 5% over pipe body.

**APPLICATIONS**
- HP/HT & Deep Wells
- Deep Water
- Shallow Water
- Horizontal & extended reach wells
- Casing while drilling
- Intermediate casing & liners
- Production casing

**OPTIONS**
- Dopeless® technology

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**Wedge 523®**
Available in sizes from 7" to 16"

**FEATURES**
- High compression rating provided by the reverse angle stab flank of the threads makes the Wedge 523® suitable for the most severe compression applications. Compression strength exceeds tension strength.
- 100% collapse rated metal-to-metal seal.
- Wedge 523® is interchangeable with Wedge 513®.

**APPLICATIONS**
- HP/HT & Deep Wells
- Deep Water
- Shallow Water
- Horizontal & extended reach wells
- Casing while drilling
- Intermediate casing & liners
- Production casing

**OPTIONS**
- Dopeless® technology
Wedge 521®
Available in sizes from 4" to 18 5/8"

FEATURES
• High compression rating provided by the reverse angle stab flank of the dovetail threads makes the Wedge 521® suitable for the more severe compression applications.
• Compression rating is typically 80–89% of the pipe body, and is usually higher than the tension rating.
• Thread form provides 100% pipe body internal yield and collapse strength.
• Excellent for large diameter pipe, the dovetail thread eliminates thread pull-out, even on thin wall pipe.

APPLICATIONS
• Deep Water
• Shallow Water
• Horizontal & extended reach wells
• Shales
• Casing while drilling
• Thermal (SAGD & CSS)
• Geothermal
• Intermediate casing
• Production casing & liners
• Surface Casing

OPTIONS
• Dopeless® technology

Blue® Near Flush
Available in sizes from 5" to 13 5/8"

FEATURES
• Designed for high performance, structural efficiency and maximum clearance.
• ISO 13679 CAL IV tested and field proven.
• Box OD only 2–3% larger than pipe body (1–2% larger than API maximum) permits use in tight clearance situations.

APPLICATIONS
• HP/HT & Deep Wells
• Deep Water
• Shallow Water
• Intermediate casing & liners
• Production casing, liners, tie-backs & tubing

OPTIONS
• Dopeless® technology

MACII™
Available in sizes from 5 1/2" to 16"

FEATURES
• High performance achieved by machining pin and box on formed ends.
• Suitable alternative for heavy wall applications with reduced clearances.

APPLICATIONS
• HP/HT & Deep Wells
• Intermediate casing, liners & tie-backs
• Production casing & liners

OPTIONS
• Dopeless® technology

INTEGRAL FLUSH
Wedge 513®
Available in sizes from 4 1/2" to 16"

FEATURES
• High compression rating provided by the reverse angle stab flank of the dovetail threads makes the Wedge 513® suitable for all liner applications. Compression strength exceeds tension strength.
• 100% internal pressure rated metal seal maintains gas sealing capability under high axial loads.
• 100% collapse rated metal-to-metal seal.
• Wedge 513® is interchangeable with Wedge 523®.

APPLICATIONS
• HP/HT & Deep Wells
• Deep Water
• Shallow Water
• Horizontal & extended reach wells
• Shales
• Casing while drilling
• Intermediate casing & liners
• Production casing & tubing

OPTIONS
• Dopeless® technology
**Wedge 511®**
Available in sizes from 2 1/16” to 18 5/8”

**FEATURES**
- High compression rating provided by the reverse angle stab flank of the dovetail threads makes the Wedge 511® suitable for use in a variety of applications requiring high clearance, high compression & torque capability. Compression strength exceeds tension strength.

**APPLICATIONS**
- HP/HT & Deep Wells
- Deep Water
- Shallow Water
- Horizontal & extended reach wells
- Casing while drilling
- Workstrings
- Thermal (SAGD & CSS)
- Geothermal
- Intermediate casing & liners
- Production casing, slotted liners & tubing

**OPTIONS**
- Dopeless® technology

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**Wedge 533®**
Available in sizes from 2 3/8” to 7 5/8”

**FEATURES**
- 100% ratings for tension and bending provided by machining pin and box on hot forged internal-external upsets. Reverse angle stab flank provides 100% compression rating.
- 100% collapse rated metal-to-metal seal.
- Wedge 533® is interchangeable with Wedge 553® and Wedge 563®.

**APPLICATIONS**
- Casing while drilling
- Workstrings
- Corrosion protection & ID coating
- Tubing

**OPTIONS**
- Dopeless® technology
- CB® ring

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**Wedge 553®**
Available in sizes from 2 3/8” to 7 5/8”

**FEATURES**
- 100% pipe body ratings for tension and bending developed using nonupset pin end and upset box end pipe. Reverse angle stab flank provides 100% compression rating.
- Wedge 553® is interchangeable with Wedge 503®, Wedge 533® and Wedge 563®.

**APPLICATIONS**
- Workstrings
- Corrosion protection & ID coating
- Tubing

**OPTIONS**
- Dopeless® technology
- CB® ring

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**BlueDock®**
Available in sizes from 18” to 38”

**FEATURES**
- 100% ratings in tension, compression and bending.
- Primary Seal Metal-to-Metal (up to 24”) or Elastomeric (pre-installed, up to 38”). Optional Secondary Elastomeric Seal.
- Gas and water sealability verified by full-scale testing on 95% pipe body VME according to the API RP 5C5 CAL I protocol.
- Up to three anti-rotational keys that prevent buck-off and provide additional support to torque retention.
- High fatigue performance under bending and/or tension/compression cycling loads given by maximized radii and avoidance of stress-risers.
- Driving installation capacity verified by full scale testing.
- Dope pockets to avoid excessive dope pressure.

**APPLICATIONS**
- HP/HT & Deep Wells
- Deep Water
- Shallow Water
- Driving Installation
- Conductor and surface casing

**OPTIONS**
- External Flush
- Sea Water Exclusion Seal
## Connections Nomenclature

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| **BLUE® SERIES** | TenarisHydril Blue® Dopeless® | TSH BLUE |
| | TenarisHydril Blue® Matched Strength | TSH BLUE-MS |
| | TenarisHydril Blue® Special Clearance 85% | TSH BLUE-SC85 (*) |
| | TenarisHydril Blue® Special Bevel | TSH BLUE-SB |
| | TenarisHydril Blue® Max Dopeless® | TSH BLUE MAX-DOPELESS |
| | TenarisHydril Blue® Heavy Wall Dopeless® | TSH BLUE HW-DOPELESS |
| | TenarisHydril Blue® Quick Seal Dopeless® | TSH BLUE QS-DOPELESS |
| | TenarisHydril Blue® Thermal Liner | TSH BLUE TL |
| | TenarisHydril Blue® Thermal Liner Dopeless® | TSH BLUE TL-DOPELESS |
| | TenarisHydril Blue® Thermal Liner Matched Strength | TSH BLUE TL-MS |
| | TenarisHydril Blue® Thermal Liner Special Clearance 90% | TSH BLUE TL-SC90 (*) |
| | TenarisHydril Blue® Thermal Liner Special Bevel | TSH BLUE TL-SB |
| | TenarisHydril Blue® Near Flush | TSH BLUE NF |
| | TenarisHydril Blue® Near Flush Dopeless® | TSH BLUE NF-DOPELESS |
| | TenarisHydril Blue® Riser | TSH BLUE RISER |

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(*) SC85 refers to 85% tensile efficiency, SC90 refers to 90% tensile efficiency - other alternatives may be available with a similar denomination.

(***) Sea Water Exclusion Seal (SWS) is an optional for all the family.

- HR & LR refer to the Wall Thickness Range (HR: High Range; LR: Low Range).
- 70 & 90 refer to the Connector’s SMYS (90: 90 ksi SMYS; 70: 70 ksi SMYS), specified depending on the required product performance.
- MTM & ELS refer to Connector’s Primary Seal (MTM: Metal to Metal; ELS: Elastomeric).